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The role of permanent dipole transitions in strong-field molecular dissociation[1] BRANDON RIGSBEE, BRETT ESRY, Kansas State University — The difficulty of finding signatures of permanent dipole transitions in strong-field molecular dissociation is well documented. The difficulty stems from two factors: (1) the standard strong-field laser wavelength of 800 nm is generally not well suited to driving purely nuclear transitions and (2) other mechanisms, such as non-adiabatic coupling, often compete with permanent dipole transitions, obscuring their effect on physical observables. We will present a theoretical study that helps elucidate the role each of these mechanisms plays. Numerical solutions of the time-dependent Schrödinger equation in the Born-Oppenheimer representation are used to calculate the kinetic energy release spectra for the dissociation of HD^+ exposed to short, intense laser pulses. We will analyze these solutions to isolate and quantify the effect of permanent dipole transitions and show their dependence on the laser parameters.

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Brandon Rigsbee
Kansas State University

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